Title: Productivity Test and Analysis of Low-Permeability N Gas Field with Thick Layers

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Abstract

Regarding the complex geological features of the low-permeability N gas field with thick layers, the combination of drill stem test (DST), regional statistical method and steady flow theory, was used to analyze the productivity of the N gas reservoir for better guidance of production. The gas reservoir was tested first by DST, and the binomial pseudo-pressure, binomial squared pressure and exponential method were used to explain the gas test data from DST of the corresponding horizon respectively. The binomial pseudo-pressure interpretation ended up as the final adoption, which showed that only the productivity in A layer had been successfully tested among 4 main gas layers in the N gas field, and B, C and D layers are gas layers with ultra-low porosity and permeability. Due to the short test time, the pressure and production did not reach a stable state, so the available data was unable to explain the productivity of the 3 layers. The regional statistical method and steady flow theory was adopted for the estimation and prediction of the productivity of the untested main layers. The arithmetic mean between the calculation results of regional statistical prediction and theoretical formula was regarded as the final value of the open flow capacity, which was as follows: the open flow capacity of the main gas layers in the N gas field is 27.74×104 m3/d, 388.92×104 m3/d, 22.56×104 m3/d and 29.27×104 m3/d, respectively. The method plays a guiding role in verifying productivity of gas wells, calculating productivity of new wells, and determining the reasonable production.

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Biography:

Quanhua Huang has completed his bachelor's degree in recovery engineering in 1993 and his PhD in oil and gas engineering in 2000 from Southwest Petroleum University. He was promoted to associate professor in 2003. Now he is mainly engaged in research and teaching of oil and gas reservoir engineering, flow and well test interpretation, and has published nearly 60 papers in domestic core journals.